

## Claims

### 1. Magnetic device successively comprising

- a first electrode (12),
- 5       - a magnetic tunnel junction successively comprising a first magnetic layer (1) forming a reference layer and having a fixed magnetization (2), an electrically insulating layer forming a tunnel barrier (3) and a second magnetic layer (4) forming a storage layer and having a reversible direction magnetization (5),
- 10       - an intermediate layer (14),
- and a second electrode (13),

device characterized in that the intermediate layer (14) constitutes a first thermal barrier formed by a material having a thermal conductivity lower than 5W/m/°C.

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2. Device according to claim 1, characterized in that a second thermal barrier is formed by a layer (15) arranged between the first electrode (12) and the first magnetic layer (1).

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3. Device according to one of the claims 1 and 2, characterized in that the material of the first and/or second thermal barriers has an electrical conductivity such that the electrical resistance of the thermal barrier is substantially lower than the electrical resistance of the tunnel barrier (3).

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4. Device according to any one of the claims 1 to 3, characterized in that the material of the first and/or second thermal barriers comprises at least one alloy containing at least one element chosen from arsenic, antimony, bismuth, germanium, tin and lead and containing at least one element chosen from sulphur, selenium, tellurium, aluminium, gallium, indium and

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thallium.

5. Device according to any one of the claims 1 to 3, characterized in that the material of the first and/or second thermal barriers comprises at least one alloy containing at least one element chosen from phosphorus, arsenic and antimony and containing at least one element chosen from iron, ruthenium, osmium, cobalt, rhodium, iridium and zinc.

6. Device according to claim 5, characterized in that the material of the first and/or second thermal barriers comprises at least one element chosen from lanthanum, cerium, praseodymium, neodymium, samarium, europium, gadolinium, thulium, ytterbium, thorium and uranium.

7. Device according to any one of the claims 1 to 6, characterized in that, the first thermal barrier being formed by an anti-ferromagnetic layer, the device comprises a magnetic decoupling layer (19) arranged between the first thermal barrier and the second magnetic layer (4).

8. Device according to claim 7, characterized in that the material of the magnetic decoupling layer (19) is chosen from tantalum, chromium, vanadium, manganese and platinum.

9. Device according to any one of the claims 1 to 8, characterized in that a third thermal barrier is formed by the tunnel barrier (3).

10. Device according to claim 9, characterized in that the material of the tunnel barrier (3) is chosen from silicon oxide, zirconium oxide and titanium oxide.

11. Read/write method of a magnetic device according to any one of the claims 1 to 10, characterized in that

- a write phase comprises flow of an electric current (I1), through the tunnel junction, from the second magnetic layer (4) to the first

magnetic layer (1), so as to heat the second magnetic layer (4) to a higher temperature than the blocking temperature of the magnetization (5) of the second magnetic layer (4),  
and a read phase comprises flow of an electric current (I<sub>2</sub>),  
through the tunnel junction, from the first magnetic layer (1) to the second magnetic layer (4).